WHAT IS CLAIMED IS:

1. A pharmaceutical composition that provides an elastin-based composition to a target site in vivo, said elastin-based composition comprising one or more elastic fibers, elastins, tropoelastins, or fragments thereof and having one or more biological activities selected from the group consisting of:

a) inhibiting the proliferation of smooth muscle cells in vivo;

b) stimulating the differentiation of smooth muscle cells in vivo; and

c) regulating the migration of smooth muscle cells in vivo.

2. The pharmaceutical composition of Claim 1 wherein said elastin-based composition is soluble and has an IC50/EC50 for each of said one or more biological activities that is less than or approximately equal to 10^{-3}.

3. The composition of Claim 2 wherein said EC50/IC50 is greater than or approximately equal to 10^{-15}.

4. The composition of Claim 1 wherein said pharmaceutical composition provides a dose of said elastin-based composition equivalent to 10^{-8} M of a peptide having the amino acid sequence of SEQ ID NO:2 at said target site.

5. The composition of Claim 1 wherein said pharmaceutical composition comprises an expression vector encoding a tropoelastin or a fragment thereof.

6. The composition of Claim 1 wherein said elastin-based composition comprises a recombinant tropoelastin.

7. The composition of Claim 1 wherein said elastin-based composition comprises a synthetic elastin peptide.

8. The composition of Claim 7 wherein said synthetic elastin peptide comprises at least two repeats of the hexameric sequence Val-Gly-Val-Ala-Pro-Gly (SEQ ID NO:1).

9. The composition of Claim 8 wherein said synthetic elastin peptide comprises 6 repeats of the hexameric sequence Val-Gly-Val-Ala-Pro-Gly (SEQ ID NO:1).

10. The composition of Claim 1 wherein said elastin-based composition is crosslinked, precipitated, or coacervated.

11. The composition of Claim 1 wherein said elastin-based composition comprises an elastin matrix produced from a blood vessel.

12. The composition of Claim 1 wherein said elastin-based composition is attached to a biocompatible support.

13. The composition of Claim 11 wherein said biocompatible support comprises a tube.

14. The composition of Claim 12 wherein said elastin-based composition is attached to an outer surface of said tube and additionally comprising a sheath encircling said tube.

15. A method for producing an elastin-based composition according to Claim 11 comprising:

a) removing adventitia from a blood vessel;

b) treating said blood vessel with an ionic denaturing detergent solution;

c) after detergent treatment, treating said blood vessel with an alkaline solution; and

d) after alkaline treatment, removing residual adventitia, if any, from said blood vessel to produce an elastin-containing matrix;

e) removing residual collagen from said elastin-containing matrix to produce an elastin matrix.

16. The method of Claim 15 wherein said detergent solution comprises sodium dodecyl sulfate.

17. The method of Claim 15 wherein said detergent solution comprises between about 0.1 and about 10% detergent.

18. The method of Claim 15 wherein said alkaline solution comprises potassium hydroxide.

19. The method of Claim 15 wherein said alkaline solution comprises about 0.1 to about 6 N base.

20. A method for preparing a biocompatible support comprising an elastin-based composition, said method comprising:

a) rehydrating the elastin matrix of Claim 11;

b) mounting said elastin matrix on a biocompatible support; and

c) drying the elastin matrix/support assembly.

21. The method of Claim 19 wherein the elastin matrix/support assembly is tubular, additionally comprising inserting the tubular elastin matrix/support assembly into a tubular sheath so that the elastin matrix is sandwiched between the support and the sheath.

22. A method for prophylaxis or treatment of a disorder characterized by diminished capacity to regulate smooth muscle cell function comprising delivery of the elastin-based composition in the pharmaceutical composition of Claim 1 to said target site.

23. The method of Claim 22 wherein said EC50 is less than or approximately equal to that of a peptide having the amino acid sequence of SEQ ID NO:2 and is greater than about 1 nM.

24. The method of Claim 22 wherein said pharmaceutical composition provides a dose of said elastin-based composition equivalent to 10^{-8} M of a peptide having the amino acid sequence of SEQ ID NO:2 at said target site.

25. The method of Claim 22 wherein said pharmaceutical composition comprises an expression vector encoding a tropoelastin or a fragment thereof.

26. The method of Claim 22 wherein said elastin-based composition comprises a recombinant tropoelastin.

27. The method of Claim 22 wherein said elastin-based composition comprises a synthetic elastin peptide comprising 6 repeats of the hexameric sequence Val-Gly-Val-Ala-Pro-Gly (SEQ ID NO:1).

28. The method of Claim 22 wherein said elastin-based composition is crosslinked, precipitated, or coacervated.

29. The method of Claim 22 wherein said elastin-based composition comprises an elastin matrix produced from a blood vessel.

30. The method of Claim 22 wherein said elastin-based composition is attached to a biocompatible support.

31. The method of Claim 30 wherein said biocompatible support comprises a tube.

32. The method of Claim 22 wherein said target site is located in the cardiovascular system and is suspected or known to be at risk for disease.

33. The method of Claim 22 wherein delivery comprises intravascular delivery of said elastin-based composition directly to a vascular site.

34. The method of Claim 33 wherein said disorder is selected from the group consisting of atherosclerosis, restenosis, vascular bypass graft stenosis, transplant arteriopathy, aneurysm, and dissection.

35. The method of Claim 22 wherein said elastin-based composition is delivered to and maintained at said site.

36. The method of Claim 35 wherein said pharmaceutical composition is a tubular elastin-based composition and said method comprises using said pharmaceutical composition as an artificial blood vessel.

37. The method of Claim 36 wherein said artifical blood vessel is used for vascular bypass.

38. The method of Claim 37 wherein said artifical blood vessel is used for coronary artery bypass grafting.

39. A method comprising implanting the pharmaceutical composition of Claim 1 at a target site is selected from the group consisting of the common bile duct, a pancreatic duct, the esophagus, the urethra, the bladder, the uterus, and an ovarian duct.

40. A method for prophylaxis or treatment of a disorder characterized by a diminished capacity to regulate smooth muscle function comprising administering an elastase inhibiter to an individual known or suspected to have such a disorder.

41. The method of Claim 40 wherein said individual has only one functional elastin gene.

42. The method of Claim 40 wherein said disorder comprises SVAS or hypertension.

43. A method to screen for a drug candidate useful in the prophylaxis or treatment of a disorder characterized by a diminished capacity to regulate smooth muscle cell function comprising administering a drug to an ELN +/- or ELN -/- organism or cell and determining whether said drug:

a) increases elastin mRNA or protein levels or elastin activity in said ELN +/- organism or cell;

b) inhibits smooth muscle cell proliferation, stimulates smooth muscle cell differentiation, or regulates vascular smooth muscle cell migration;

c) inhibits occlusion of arteries in said organism; and/or

d) lengthens the lifespan of said ELN -/- organism.

44. The method of Claim 43 wherein said disorder comprises atherosclerosis, SVAS, or hypertension, and said method comprises measuring synthesis of elastin RNA in the presence of said drug as an indication of said drug's capacity to increase elastin mRNA levels.

45. The method of Claim 43 wherein said disorder comprises atherosclerosis, SVAS, or hypertension, and said method comprises measuring synthesis of elastin protein in the presence of said drug as an indication of said drug's capacity to increase elastin protein levels.

46. The method of Claim 43 wherein said disorder comprises atherosclerosis, SVAS, or hypertension, and said method comprises measuring activity of elastase in the presence of said drug as an indication of said drug's capacity to increase elastin protein levels.

47. The method of Claim 43 wherein said disorder comprises atherosclerosis, transplant arteriopathy, or restenosis, and said method comprises treating an ELN -/- organism or ELN -/- cell with said drug and measuring inhibition of vascular smooth muscle cell proliferation, stimulatation of vascular smooth muscle cell differentiation, or regulatation of vascular smooth muscle cell migration.

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